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MEMORANDUM FOR DR. A. D. HOPKINS.

INTER-RELATION OF FOREST FIRES AND INSECTS.

DATA FOR 1918.

MISTLETOE BURN.
SISKIYOU BURN.
CHINQUAPIN BURN.
OREGON.

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May 7, 1919.

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INTER*RELATION of INSECTS and FIRES

Data for 1918

SUMMARY OF STUDIES.

THE MISTLETOE BURN

A study of the influence of a forest fire upon the infestation within and surrounding a burned area was made possible by a fire which occurred upon the Mistletoe unit of the Rogue River area in the fall of 1917. This unit, comprising an area of about 8000 acres is located at the southern end of the Rogue River area which has been under study by this station since 1914. The stand of pine timber upon the unit has been estimated at 35 million feet, board measure, about 80 percent of this being yellow pine, the balance sugar pine. An equal amount of Douglas fir is mixed with the pine timber.

Status of Infestation at
time of fire.

A quantitative study of the insect infestation in the pine had been in progress since 1914, and the volume of timber which had been killed during the four season preceeding the fire is shown as follows:

Year of attack:	1914	:	1915	:	1916	:	1917	:
Vol.killed by:		:		:		:		:
D.brevicomis:	34,900	:	140,660	:	223,440	:	87,260	:
Vol.killed by								
other causes:	27,050	:	32,800	:	8,280	:	66,330	:
Total annual								
loss	61,950	:	173,460	:	231,720	:	93,590	:
% of loss due								
to D.brevicomis	56.3%	:	81.%	:	94.%	:	93.2%	:

This shows a pronounced epidemic cycle of increase and decrease in the infestation, D.brevicomis in yellow pine being the predominating factor. At the time when the fire occurred the infestation had just gone through a decrease of more than 75%.

Character of the Burn

The fire occurred Oct.29, 1918, at the close of a long dry season, and covered 800 acres or just about 10% of the total area of the unit and 9% of the total pine volume of the unit. The character of the burn was fairly typical of the majority of the fires occurring in this region. In the open and mature stands the fire was confined to the ground running over the surface with little damage except the killing of seedlings and small growth. In the thickets of new growth and brush areas the fire developed great intensity and killed or consumed forest growth of all kinds.

During the season of 1918 an intensive cruise was made of the burned area, all standing trees being examined both for fire injury and for insect attacks. An analysis of the fire damage as recorded on all

trees, 10 inches and over DBH, shows the following :

		Yellow Pine		Percent of stand	
		No. trees	Volume	Trees	volume
Class 1	Uninjured by fire	- 1,577	- 1,385,430	- 65.5	- 65.
Class 2	Killed by fire	- 80	- 16,720	- 3.3	- .7
Class 3	Light fire injury	- 573	- 539,370	- 24.	- 25.
Class 4	Medium " "	- 63	- 60,360	- 2.2	- 2.8
Class 5	Heavy " "	- 167	- 140,450	- 5.	- 6.5
Totals		2400	2,152,330	100.	100.
Class 1	Uninjured by fire	- 288	- 450,830	- 78.2	- 77.
Class 2	Killed by fire	- 3	- 460	- .8	- .1
Class 3	Light fire injury	- 63	- 114,150	- 17.1	- 19.5
Class 4	Medium fire injury	- 5	- 7,380	- 1.4	- 1.2
Class 5	Heavy " "	- 9	- 12,570	- 2.5	- 2.2
Totals		368	585,390	100.	100.

Trees in classes 3, 4 and 5 represent those which survived the fire but with varying degrees of injury. Class 3 had the foliage partially scorched: class 4 had the entire foliage scorched but not sufficiently to kill the buds which had formed for the next seasons growth: in class 5 the entire foliage was burned away, but the cambium of the bark was still green indicating possible though doubtful recovery of the tree.

It will be seen that the fire resulted in a very low percent of damage to the merchantable trees. In yellow pine where the greater amount of loss was sustained we have the following:

Less than 1% of the stand was killed outright.

Only 6.5% of the stand was injured so that recovery was doubtful

In 28.6% scorching of foliage was noticeable but not enough to interfere with the out put of new growth the following season.

The remainder of the stand (65%) was uninjured by the fire.

The degree of injury to Douglas fir was about the same as that in the pine. No detailed study was made of this species as we do not have the corresponding data on infestation in this host.

Development of Infestation after Fire

At the time of the fire 6 trees were standing within the burn area which contained advanced broods of *D. brevicornis*. These broods were exposed to a certain amount of heat due to the scorching of the outer bark. In five of these trees there was a normal emergence of beetles following the fire. In one tree part of the broods in the larval and pupae stage were killed on one side of the tree where the heat appeared to have been the most severe.

Very few if any new attacks of beetles occurred in the fall of 1917 following the fire. However the attraction of the fire injured trees was quite marked when the first attacks began to occur in the spring of 1918. Within a small part of the burn where the pine predominated a heavy center of infestation developed during the spring and summer. The following figures compare the amount of infestation which developed in 1917 preceeding the fire with that which developed in 1918 following the fire both within the burned area and upon the remainder of the Mistletoe unit outside of the burned area.

Year of loss	Burned Area		Mistletoe Unit outside of burned area	
	No. Trees	Volume	No. trees	Volume
1917	20	12,500	140	81,090
1918	242	159,720	93	81,250
Increase, 1918, 1110.0%		1177 ¹ / ₂ %	--	.2%
Decrease, "	-	-	34%	-

This shows that within the burned area the infestation during the season following the fire increased more than 1100 percent both in the number of trees and in their total volume. Surrounding the burn the number of infested trees decreased 24% while the volume remained at a standstill. Taking the mistletoe unit as a whole both inside and outside of the burned area the increase amounted to 132% in 1918 over 1917.

These attacks of *D. brevicornis* were much more plentiful during the early part of the season and toward fall there was a marked falling off in the number of trees attacked. This is shown by a comparison of the first and second generation trees.

	No. trees.	Volume	% of decrease
First Gen. 1918-	157	105,000	
2nd " "	53	35,400	66%

Progress of Infestation Outside of Mistletoe Unit.

In all other areas studied in the Rogue River valley there was a marked tendency toward an increase of the infestation. We have fairly accurate figures for the Lamb's Mine and Ashland units altho the 1918 data is not quite complete. The Lamb's Mine unit lies from three to four miles northwest of the Mistletoe burn while the Ashland unit is situated from five to seven miles distant in the same direction. The progress of the infestation on these two areas during the past 5 years is shown as follows:

Lamb's Unit					:	Ashland Unit				
	No. trees	volume	increase	decrease	:	No. trs.	Volume	increase	decrease	
1914	82	80,820			:	55	56,250			
1915	372	227,290	273%		:	246	242,360	316.0%		
1916	260	142,370		48%	:	426	355,600	35.0%		
1917	86	65,620		64%	:	191	116,190			63.0%
1918	96	90,050	37%		:	203	203,280	74%		

These comparisons indicate that the Lamb's unit may have been influenced to some extent by the attraction of the burn. Even the Ashland unit may have been influenced to some extent as we find here an increase of only 74% whereas the beetles attracted to the burn caused the increase of 132% for the Mistletoe unit.

Attraction of Fire Injured Trees

Considerable attention was given to a study of the degree to which the various classes of fire injured trees attracted the beetles. In yellow pine the results were as follows:

No fire-killed trees were attacked by the beetles.

75% of the attacks were in trees belonging to Class 3 and Class 4: i.e. trees slightly or moderately scorched by the fire.

17 % of the attacks were in Class 5 trees, those with the foliage entirely burned away but with green cambium.

8% of the attacks were in trees uninjured in any way by the fire.

Development of D.brevicomis Broods in Fire Scorched Trees

It was noted during the summer that the broods in many of the fire scorched trees were not developing normally. The condition which is known as "sour sap" was prevalent at the base of a majority of the infested trees. This resulted in an abnormally moist and wet condition of the inner bark which apparently drowned or killed many of the broods in the young larval stage before they entered the outer bark. During the fall of 1918, 272 square feet of bark were collected from 28 trees within the burn. This averaged nearly 10 square feet from each tree. An effort was made to select fairly representative trees and the bark was collected from each tree in sections, averaging two square feet, at varying heights ranging from 6 to 70 feet above the base. The entrance, ventilation and emergence holes were counted on each section. The total results were as follows:

Square feet of bark counted	- - - - -	272.39
Total No. Entrance holes	- - - - -	1372.
" " Ventilation holes	- - - - -	1702.
" " Exit holes	- - - - -	3277.

In this amount of bark which was carefully analyzed the entrance holes compare to exit holes as 1372 to 3277. The total bark surface represented by the trees from which this bark was collected amounts to 6372 square feet. Applying this same ratio of entrance to exit holes we would have a total of 33,568 entrance and 69,724 exit holes in the trees represented.

Previous studies in this region indicate that each entrance hole represents the attack of from 2 to 3 parent adults (averaging 2.59) while each entrance hole represents the emergence of but one new adult. Assuming that this data will apply to the trees upon the burn we have the following:

Total number of beetles attacking	(33,568 x 2.59)	- - -	-86,941
" " " " emerging	(69,724 x 1)	- - -	-69,724
Excess of attack over emergence	- - - - -	-	17,217

This indicates that altho a heavy center of infestation developed upon the burn area, a reduction of nearly 20% in the numbers of beetles during the season resulted from the failure of brood development in fire scorched trees. These data will be supplemented by the study of an equal amount of bark from trees outside of the burn which were attacked during the same period. It is planned to complete this study by the close of the field season.

Summary-Mistletoe Burn

1. This fire, which killed less than 1% of the merchantable pine timber and injured less than 40% of the remainder, established a strong attractive influence which drew the attacks of *Dendroctonus* beetles for at least one season following its occurrence.
2. No standing fire-killed trees were attacked by the beetles.
3. Trees which suffered light and medium fire injury to the foliage (partial or entire scorching of the needles) attracted 75% of the barkbeetle attacks within the area of the burn.
4. The volume of infested timber within the burned area increased 1100% during the season following the fire over that of the preceeding season. In the area surrounding the burn for a distance of three miles the volume of infested timber remained static during the same period. Beyond this distance the volume increased 37% to 74%, the greatest increase being noted at the greatest distance from the burn.
5. The broods of *D. brevicornis* did not develop successfully within the fire scorched trees due to the condition known as "sour sap". A bark analysis from 11% of the trees within the burn indicates that there was a decrease of about 20% of the beetles emerging from those which originally attacked and entered the bark.

CHINQUAPIN BURN

A preliminary report was submitted on this area in May, 1917. The fire occurred in September, 1915, and we now have the data for the subsequent seasons of 1916, 1917 and 1918. The burn covered 220 acres and the fire damage was of practically the same type as that of the Mistletoe burn. The influence of the fire was most marked during the season of 1916, or the year following its occurrence. During this season there was a concentration of *D. brevicornis* within the burned area resulting in an increase of 475% over 1915. The greater part of the attacks were in trees which had been scorched by the fire. For a distance of three miles in the area surrounding the burn there was a decrease of 68%. In 1917 the infestation decreased both within the burn and the surrounding area. In 1918 the infestation increased again both within the burn and the greater part of the surrounding area. It may be said that in 1917 and 1918 the infestation followed the general course of the barkbeetle epidemic which was under study throughout the Rogue River area. On the whole the data indicates that the influence of the fire was neutralized before the close of the second season following its occurrence.

SISKIYOU BURN

This fire occurred in August, 1918, and covered about 200 acres situated approximately four miles south of the Mistletoe unit. The burn and the surrounding area have been organized as the Siskiyou unit and in the fall of 1918 a cruise and study were made along the same lines as on the Mistletoe burn. The data collected has been worked up in table form only. Sufficient time has not elapsed between the date of the burn and collection of the data to warrant any conclusions or statements other than the summary of the actual fire damage.

THE MISTLETOE BURN.

The Burn.

Location:

In the southwestern end of the Rogue River Valley, Oregon, in sections 25, 26 and 36, Twp 39 S, R 1 and 2 East and sections 1 and 2 Twp 40 S, R 1 East, Willamette Meridian.

Area:

Size of burned area 862 acres.

Topography:

Rugged foothills in the northern spurs of the Siskiyou Range. There is no level ground on the area. Gentle and steep slopes of north, east, west and south exposures.

Elevation:

Elevations range from 3,000 to 4,000 feet.

Drainage:

This is all to the northward. A number of small creeks contribute to this; principal among these are Neil Creek, Clayton Creek and Tollman Creek; all are tributaries of Rogue River.

Soil:

Decomposed granite on all exposures.

Forest Cover:

Mostly chaparrall type, consisting of Ceanothus and Manzanita, on the lower elevations; Higher, coniferous forests of mature trees and dense stands of new growth.

Timber Types:

A mixed stand of western yellow pine and Douglas fir of average quality with a very little sugar pine intermixed. Relative percentages of stand are approximately:

	<u>In No. trees.</u>	<u>In volume.</u>
Yellow pine	38.5%	44.5%
Douglas fir	60.0%	52.5%
Sugar pine	1.5%	3.0%
Totals	100.0%	100.0%

Table I.

Comparative figures for separate species on a portion of burn.

:Diam.:Unit	: Yellow pine	: Sugar pine	: Douglas fir
: Ins.:Volume:	No. trees Volume.	No. trees. Volume.	No. trees. Volume.
: 10 : 1100 :	200 20,000 :	5 500 :	533 53,300 :
: 14 : 140 :	76 10,640 :	1 140 :	154 21,560 :
: 18 : 220 :	52 11,440 :	1 220 :	65 14,300 :
: 20 : 260 :	30 7,800 :		19 4,940 :
: 22 : 380 :	33 12,500 :	2 760 :	29 11,020 :
: 24 : 480 :	81 38,880 :	3 1,440 :	36 17,280 :
: 26 : 700 :	49 24,300 :	5 3,500 :	22 15,400 :
: 28 : 970 :	19 18,430 :	2 1,940 :	7 6,790 :
: 30 : 1170 :	21 24,570 :	5 5,850 :	13 15,210 :
: 32 : 1500 :	14 21,000 :		13 19,500 :
: 34 : 1860 :	9 16,740 :		13 24,180 :
: 36 : 2110 :	9 18,990 :	1 2,110 :	17 35,870 :
: 38 : 2610 :	5 13,050 :	1 2,610 :	10 26,100 :
: 40 : 2920 :	4 11,680 :	1 2,920 :	7 20,440 :
: 42 : 3260 :	1 3,260 :		1 3,260 :
: 44 : 3890 :			
: 46 : 4590 :	1 4,590 :		
: 48 : 4800 :	1 4,800 :		1 4,800 :
: 50 : 5880 :	1 5,880 :		2 11,760 :
:	606 258,590 :	27 21,990 :	942 305,710 :

Stand:

Pine timber on burned area.

	<u>No. trees.</u>	<u>Volume.</u>
Yellow pine (green and fire injured)	2,400	2,142,330
Yellow pine (infested 1918)	220	144,570
	2,620	2,286,900
Sugar pine (green and fire injured)	368	585,390
Sugar pine (infested 1918)	22	15,150
	390	600,540
Total stand, both species	3,010	2,887,440

Table II.

Total stand of yellow pine and sugar pine timber on the burned area.

: Diam. :	Unit :	Yellow pine :		Sugar pine :	
: Ins. :	Volume. :	No. trees.	Volume. :	No. trees.	Volume. :
: 10 :	100 :	278	27,800 :	26	2,600 :
: 12 :	120 :	22	2,640 :	2	240 :
: 14 :	140 :	353	46,620 :	53	7,420 :
: 16 :	180 :	12	2,160 :	2	360 :
: 18 :	220 :	285	62,700 :	31	6,820 :
: 20 :	260 :	220	57,200 :	22	5,720 :
: 22 :	380 :	164	62,320 :	16	6,080 :
: 24 :	480 :	365	175,200 :	35	16,800 :
: 26 :	700 :	150	105,000 :	4	2,800 :
: 28 :	970 :	127	123,190 :	15	14,550 :
: 30 :	1170 :	127	148,590 :	21	24,570 :
: 32 :	1500 :	59	88,500 :	14	21,000 :
: 34 :	1860 :	114	212,040 :	20	37,200 :
: 36 :	2110 :	77	162,470 :	22	46,420 :
: 38 :	2610 :	71	185,310 :	20	52,200 :
: 40 :	2920 :	101	294,920 :	38	110,960 :
: 42 :	3260 :	17	55,420 :	4	13,040 :
: 44 :	3890 :	49	190,610 :	18	70,020 :
: 46 :	4590 :	1	4,590 :	8	36,720 :
: 48 :	4800 :	28	134,400 :	7	33,600 :
: 50 :	5880 :	13	76,440 :	8	47,040 :
: 60 :	8820 :	5	44,100 :	1	8,820 :
: 62 :	11610 :			2	23,220 :
: 64 :	12340 :	2	24,680 :	1	12,340 :
:	:	2,620	2,286,900 :	390	600,540 :

Infestation:

On burned area preceeding fire;

1917 infestation:

	No. trees.	Volume.
Yellow pine	20	12,500
Sugar pine		
Total	20	12,500

Table III.

The 1917 infestation on the burned area, preceding the fire. (In yellow pine).

Diam.	Unit	Dendroctonus brevicomis.		D. monticolae	
		1st generation	2nd generation	1917 generations	
	Volume	No. trees	volume	No. trees	volume
10	100		1	100	
14	140		3	420	
16	180	1	180		
18	220		1	220	
20	260		2	520	
22	380		1	380	
24	480		4	1,920	
26	970	1	970		
30	1170		2	2,340	
32	1500		1	1,500	
42	3260		1	3,260	
		2	1,150	17	11,630
				1	100

The Fire:

Date of burn October 29, 1917.

Character of fire: Ground fire of great intensity in the thickets of new growth and brush areas. In the open, mature, stands the fire was confined to the ground, running over the surface with but little damage.

Resulting damage; A number of small and medium sized trees were killed outright while some of the larger specimens suffered basal injuries in the form of "fire scars" on the trunks near the ground.

Table IV.

Summary - Table of comparative fire injury.

Yellow Pine.					
Degree of fire injury		No. trees.	volume B.F.	% of stand.	
Uninjured by fire; Class I.		1,577	1,385,430	65.5	65.0
Killed by fire; Class II.		80	16,720	3.3	.7
Light fire injury; Class III.		573	539,370	24.0	25.0
Medium " " Class IV.		63	60,360	2.2	2.8
Heavy " " Class V.		107	140,450	5.	6.5
Totals		2400	2,142,330	100.0	100.0

: Sugar pine.							:
: Degree of fire injury	:	No.trees.	Volume	B.F.	:	% of stand.	:
:	:	:	:	:	:	trees volume	:
: Uninjured by fire Class I.:	288	450,830	:	78.2	77.0	:	:
: Killed by fire Class II.:	3	460	:	.8	.1	:	:
: Light fire injury Class III.:	63	114,150	:	17.1	19.5	:	:
: Medium " " Class IV.:	5	7,380	:	1.4	1.2	:	:
: Heavy " " Class V.:	9	12,570	:	2.5	2.2	:	:
: Totals	368	585,390	:	100.0	100.0	:	:

Table V.

Volume table of degree of fire injury to yellow pine on burned area.

: Diam.:	Unit	: Class I.	: Class II.	: Class III.	: Class IV.	: Class V.	:
: Ins.:	Volume:	No. Volume:	No. Volume:	No. Volume:	No. Volume:	No. Volume:	:
: 10 :	100 :	170 17,000:	39 3,900:	41 4,100 :	7 700 :	1 100 :	:
: 14 :	140 :	192 26,880:	27 3,780:	73 10,220 :	6 840 :	4 560 :	:
: 18 :	220 :	178 39,160:	5 1,100:	64 14,080 :	2 440 :	13 2,860 :	:
: 20 :	260 :	144 37,440:	3 780:	48 12,480 :	5 11,300 :	2 520 :	:
: 22 :	380 :	93 35,340:	1 380:	48 18,240 :	5 1,900 :	6 2,280 :	:
: 24 :	480 :	212 101,760:	2 960:	92 44,160 :	11 5,280 :	24 11,520 :	:
: 26 :	700 :	96 67,200:	1 700:	31 21,700 :	1 700 :	9 6,300 :	:
: 28 :	970 :	80 77,600:	:	27 26,190 :	4 3,880 :	5 4,850 :	:
: 30 :	1170 :	84 98,280:	:	25,29,250 :	6 7,020 :	5 5,850 :	:
: 32 :	1500 :	47 70,500:	:	6 9,000 :	4 6,000 :	1 1,500 :	:
: 34 :	1860 :	74 137,640:	1 1,860:	23 42,780 :	2 3,720 :	6 11,160 :	:
: 36 :	2110 :	43 90,730:	:	16 33,760 :	2 4,220 :	10 21,100 :	:
: 38 :	2610 :	41 107,010:	:	17 44,370 :	1 2,610 :	5 13,050 :	:
: 40 :	2920 :	62 181,040:	:	27 78,840 :	5 14,600 :	6 17,520 :	:
: 42 :	3260 :	4 13,040:	1 3,260:	8 26,080 :	1 3,260 :	2 6,520 :	:
: 44 :	3890 :	27 105,030:	:	17 66,130 :	1 3,890 :	4 15,560 :	:
: 46 :	4590 :	:	:	1 4,590 :	:	:	:
: 48 :	4800 :	17 81,600:	:	5 24,000 :	:	4 19,200 :	:
: 50 :	5880 :	8 47,040:	:	2 11,760 :	:	:	:
: 60 :	8820 :	3 26,460:	:	2 17,640 :	:	:	:
: 64 :	12340 :	2 24,680:	:	:	:	:	:
:	:	1,5771,385,430:	80 16,720:	573539,370 :	63 60,360 :	107140,450 :	:

Table VI.

Volume table of degree of fire injury to sugar pine on burned area.

:Diam.:Unit	: Class I.	: Class II.	: Class III.	: Class IV.	: Class V.
:Ins. :Volume: No.	Volume: No.	Volume: No.	Volume: No.	Volume: No.	Volume: No.
: 10 : 100 : 17	1,700: 1	100: 4	400:	:	:
: 14 : 140 : 39	5,460: 1	140: 6	840:	:	:
: 18 : 220 : 23	5,060: 1	220: 5	1,100:	1 220:	1 220:
: 20 : 260 : 18	4,680:	: 2	520: 1	260 :	:
: 22 : 380 : 13	4,940:	: 2	760:	:	:
: 24 : 480 : 28	13,440:	: 5	2,400:	: 2	960:
: 26 : 700 : 3	2,100:	:	:	:	:
: 28 : 970 : 11	10,760:	: 3	2,910:	: 1	970:
: 30 : 1170 : 11	12,870:	: 7	8,190: 2	2,340 :	1 1,170:
: 32 : 1500 : 9	13,500:	: 5	7,500:	:	:
: 34 : 1860 : 19	35,340:	:	: 1	1,860 :	:
: 36 : 2110 : 17	35,870:	: 2	4,220:	: 3	6,330:
: 38 : 2610 : 14	36,540:	: 6	15,660:	:	:
: 40 : 2920 : 30	87,600:	: 5	14,600: 1	2,920 :	1 2,920:
: 42 : 3260 : 2	6,520:	: 2	6,520:	:	:
: 44 : 3890 : 13	50,570:	: 4	15,560:	:	:
: 46 : 4590 : 8	36,720:	:	:	:	:
: 48 : 4800 : 4	19,200:	: 2	9,600:	:	:
: 50 : 5880 : 6	35,280:	: 2	11,760:	:	:
: 60 : 8820 : 1	8,820:	:	:	:	:
: 62 : 11610 : 1	11,610:	: 1	11,610:	:	:
: 64 : 12340 : 1	12,340:	:	:	:	:
: : : 268	450,830: 3	460: 63	114,150: 5	7,380 :	9 12,570

Infestation developing after fire:

Summary of 1918 infestation inside burned area.

	:No. trees	Volume:	:No. trees	Volume:
D. brevicomis 1st gen in Y.p.	157	105,000:		
D. brevicomis 2nd gen in Y.p. .q.....	53	35,400		
D. monticolae 1918 genrs in Y.p.	5	3,190		
Flatheads 1918 genrs in Y.p.	5	980		
	220	144,570	220	144,570
D. monticolae 1918 genrs in S. p. ..	22	15,150		
			22	15,150
Total 1918 infestation inside burned area			242	159,720

Table VII.

Volume table of the 1918 loss by insects inside burned area.

: Infestation in yellow pine : sugar pine : & :														
: Diam. :	Unit :	: D.b.1st1918 :		: D.b.2nd1918 :		: D.m. 1918 :		: Flathead 18 :		: D.m. 1918 :		: Total Y.P. :		: Grand total :
: Ins. :	: Volume:	No.	Volume:	No.	Volume:	No.	Volume:	No.	Volume:	No.	Volume:	No.	Volume:	No.
: 10 :	100:	15	1,500:	3	300:	1	100:	1	100:	4	400:	20	2,000:	24
: 12 :	120:	20	2,400:	1	120:	1	120:		:	2	240:	22	2,640:	24
: 14 :	140:	16	2,240:	13	1,820:	1	140:	1	140:	7	980:	31	4,340:	38
: 16 :	180:	11	1,980:	1	180:		:		:	2	360:	12	2,160:	14
: 18 :	220:	13	2,860:	8	1,760:	1	220:	1	220:	1	220:	23	5,060:	24
: 20 :	260:	11	2,860:	5	1,300:		:	2	520:	1	260:	18,	4,680:	19
: 22 :	380:	5	1,900:	6	2,280:		:		:	1	380:	11	4,180:	12
: 24 :	480:	21	10,080:	3	1,440:		:		:		:	24	11,520:	24
: 26 :	700:	12	8,400:		:		:		:	1	700:	12	8,400:	13
: 28 :	970:	6	5,820:	5	4,850:		:		:		:	11	10,670:	11
: 30 :	1170:	7	8,190:		:		:		:		:	7	8,190:	17
: 32 :	1500:		:	1	1,500:		:		:		:	1	1,500:	1
: 34 :	1860:	6	11,160:	2	3,720:		:		:		:	8	14,880:	8
: 36 :	2110:	5	10,550:	1	2,110:		:		:		:	6	12,660:	6
: 38 :	2610:	4	10,440:	2	5,220:	1	2,610:		:		:	7	18,270:	7
: 40 :	2920:		:	1	2,920:		:		:	1	2,920:	1	2,920:	2
: 42 :	3260:	1	3,260:		:		:		:		:	1	3,260:	1
: 44 :	3890:		:		:		:		:	1	3,890:		:	1
: 48 :	4800:	2	9,600:		:		:		:	1	4,800:	2	9,600:	3
: 50 :	5880:	2	11,760:	1	5,880:		:		:		:	3	17,640:	3
:	:	157	105,000:	53	35,400:	5	3,190:	5	980 :	22	15,150:	220	144,570:	242
:	:													159,720:

Class of trees attacked after fire:

Summary:

- Class I. Green trees; uninjured by fire.
- Class II. Fire killed trees.
- Class III. Light burn; trunk and lower limbs scorched.
- Class IV. Medium burn; nearly or all of foliage scorched.
- Class V. Heavy burn; trunk scorched and foliage burned off.

Yellow pine.

: Class of injury :		No. trees.	Volume :	Percent of infestation		:
:	:	:	:	No. trees	Volume	:
:	I.	17	18,250	8.0	12.8	:
:	II.	:	:	:	:	:
:	III.	81	56,800	37.0	39.2	:
:	IV.	84	45,180	38.0	31.3	:
:	V.	38	24,340	17.0	16.7	:
:	Totals	220	144,570	100.0	100.0	:

Sugar pine.

:	I.	5	6,120	23.0	40.3	:
:	II.	:	:	:	:	:
:	III.	4	3,340	18.0	22.0	:
:	IV.	7	5,050	32.0	33.5	:
:	V.	6	640	27.0	4.2	:
:	Totals	22	15,150	100.0	100.0	:

Table VIII.

Volume table of class of trees attacked after fire.

Yellow pine.									
Diam.:	Unit	Class I.		Class III.		Class IV.		Class V/	
Ins.:	Volume:	No.	Volume:	No.	Volume:	No.	Volume:	No.	Volume:
10	100	4	400	3	300	7	700	6	600
12	120	1	120	6	720	7	840	8	960
14	140	2	280	13	1,820	11	1,540	5	700
16	180			3	540	7	1,260	2	360
18	220	2	440	12	2,640	9	1,980		
20	260			7	1,820	5	1,300	6	1,560
22	380			7	2,660	4	1,520		
24	480	3	1,440	7	3,360	10	4,800	4	1,920
26	700			5	3,500	6	4,200	1	700
28	970			2	1,940	8	7,760	1	970
30	1170			4	4,680	2	2,340	1	1,170
32	1500			1	1,500				
34	1860	1	1,860	2	3,720	5	9,300		
36	2110			4	8,440	1	2,110	1	2,110
38	2610	3	7,830	2	5,220	1	2,610	1	2,610
40	2920					1	2,920		
42	3260			1	3,260				
48	4800			1	4,800			1	4,800
50	5880	1	5,880	1	5,880			1	5,880
		17	18,250	81	56,800	84	45,180	38	24,340
Sugar pine.									
10	100							4	400
12	120							2	240
14	140	1	140	3	420	3	420		
16	180					2	360		
18	220	1	220						
20	260	1	260						
22	380					1	380		
26	700	1	700						
40	2920			1	2,920				
44	3890					1	3,890		
48	4800	1	4,800						
		5	6,120	4	3,340	7	5,050	6	640

AREA SURROUNDING THE BURN.

Topography:

Consistent with that in the burned area.

Timber types:

Brush areas on the lower elevations; coniferous forests on the intermediate and higher elevations.

Stand:

A mixed stand of yellow pine, sugar pine and Douglas fir.
Relative percentages of stand are; approximately:

Yellow pine	45.%	Volume	B.F.
Sugar pine	3.%	"	"
Douglas fir	52.%	"	"
Total	100.%		

Infestation surrounding the burned area:

Unit.	Insect and host.	Year of loss.			
		1917		1918 (Part)	
		No. trees	Volume	No. trees	Volume
Siskiyou Unit.	D. brevicornis 1st genr in Y.P.	35	49,000	78	95,530
	D. brev. 2nd genr in Y.P.	60	84,000	49	68,540
	Melanophila sp. in Y.P.			1	380
	D. monticolae all 8 genrs in S.P.	2	4,810		
		97	137,810	128	164,450
Mistletoe Unit.	D. brev 1st genr in Y.P.	40	28,410	58	52,000
	D. brev 2nd genr in Y.P.	85	58,850	34	29,150
	D. monticolae all 11 genrs in Y.P.	33	1,400	1	100
	D. monticolae all 6 genrs in S.P.	2	4,810		
		160	93,470	93	81,250
Lamb's Mine.	D. brev 1st genr in Y.P.	18	12,000	35	28,660
	D. brev 2nd genr in Y.P.	45	27,010	41	36,130
	D. monticolae genrs in Y.P.	5	780	3	360
	Melanophila sp. in Y.P.			1	480
	D. monticolae genrs in S.P.	8	16,410	2	3,520
		76	56,200	82	69,150
Ashland Unit.	D. brevi 1st genr in Y.P.				
	D. brevi 2nd genr in Y.P.				
	D. monticolae genr in Y.P.	116	116,190	205	201,280
		116	116,190	205	201,280

Table IX.

Volume table of the 1918 loss in the Mistletoe Unit.

Diam.:Unit	D.b. 1st 18 Y.P.	D.b. 2nd 18 Y.P.	D.b. 18 in Y.P.	Flatd 18 in Y.P.	Topkilled Y.P.
Ins. : Volume : No. trees	Volume : No. trees	Volume : No. trees	Volume : No. trees	Volume : No. trees	Volume : No. trees
10 : 100 : 8	800	1 : 100	1	3 : 300	
12 : 120 : 7	840	3 : 360			1 : 120
14 : 140 : 5	700	2 : 280			
16 : 180 : 3	540	2 : 360			
18 : 220 : 5	1,100	1 : 220			1 : 220
20 : 260 : 1	260	4 : 1,040			2 : 520
22 : 380 : 3	1,140	1 : 380			2 : 760
24 : 480 : 7	3,360	3 : 1,440			2 : 960
26 : 700 : 3	2,100	3 : 2,100			
28 : 970 : 4	3,880	5 : 4,850			1 : 970
30 : 1170 : 2	2,340				1 : 1,170
32 : 1500 : 1	1,500	4 : 6,000			
34 : 1860 : 2	3,720	1 : 1,860			1 : 1,860
36 : 2110 : 2	4,220	3 : 6,330			
40 : 2920 : 2	5,840				1 : 2,920
48 : 4800 :		1 : 4,800			1 : 4,800
50 : 5880 : 2	11,760				
60 : 7900 : 1	7,900				
	58 : 52,000	34 : 30,120	1 : 100	3 : 300	13 : 14,300

TABLE X.

Development of broods in fire injured trees.

Total Bark Surface.			Entrance Holes.			Ventilation Holes.			Exit Holes.		
Tree#:	Sq ft bark:	No sq st	Counted:	Average	Total for trees	Counted:	Average	Total for trees	Counted:	Average	Total
:	surface	counted	:	per sq ft:	computed	:	per sq ft:	ees computed	:	per sq ft:	comp:
B10 :	308	: 13.5	150	: 11.1	: 3419	211	: 15.	: 4620	1064	: 78.8	: 24,270
B11 :	360	: 18.88	132	: 7.	: 2525	102	: 5.4	: 1944	286	: 13.7	: 4,932
B13 :	180	: 10.	79	: 7.9	: 1422	96	: 9.6	: 1725	114	: 11.4	: 2,052
B18 :	103	: 7.5	20	: 2.6	: 268	29	: 3.8	: 391	26	: 3.46	: 356
B29 :	162	: 4.16	15	: 3.6	: 583	13	: 3.1	: 505	42	: 10.	: 1,650
BEO :	158	: 5.25	24	: 4.5	: 711	12	: 2.28	: 360	24	: 4.5	: 711
B36 :	322	: 18.55	82	: 4.42	: 1467	154	: 8.3	: 2855	208	: 11.2	: 3,718
B39 :	360	: 18.5	123	: 6.6	: 2376	147	: 7.9	: 2853	275	: 15.	: 5,400
B37 :	351	: 13.8	52	: 3.76	: 1320	66	: 4.7	: 1650	120	: 8.7	: 3,054
B72 :	190	: 10.3	64	: 6.2	: 1178	80	: 7.8	: 1482	113	: 10.97	: 2,084
B73 :	215	: 8.	40	: 5.	: 1075	48	: 6.	: 1290	49	: 6.	: 1,290
B74 :	109	: 11.54	46	: 4.	: 436	57	: 4.9	: 534	56	: 4.8	: 523
B76 :	130	: 5.36	21	: 4.	: 420	13	: 2.4	: 312	19	: 3.5	: 455
B77 :	367	: 36.8	80	: 2.	: 771	115	: 3.	: 1137	308	: 8.	: 3,046
B88 :	344	: 8.23	32	: 3.9	: 1342	57	: 6.9	: 2374	52	: 6.3	: 2,167
B91 :	130	: 4.94	39	: 7.9	: 1027	42	: 8.5	: 1105	32	: 6.46	: 840
B93 :	130	: 7.	29	: 4.	: 420	39	: 5.5	: 715	17	: 2.4	: 312
B94 :	335	: 7.	42	: 6.	: 2010	49	: 7.	: 2345	42	: 6.	: 2,010
B96 :	162	: 4.	16	: 4.	: 648	10	: 2.5	: 405	15	: 3.75	: 608
B111:	251	: 7.58	52	: 6.8	: 1707	36	: 4.75	: 1192	48	: 6.3	: 1,581
B112:	162	: 8.13	27	: 3.3	: 534	32	: 3.9	: 632	42	: 5.16	: 836
B115:	130	: 3.4	29	: 8.5	: 1105	29	: 8.5	: 1105	9	: 2.5	: 325
B118:	130	: 8.5	27	: 3.17	: 412	40	: 4.7	: 611	56	: 6.5	: 845
B120:	153	: 8.33	43	: 5.16	: 789	51	: 6.12	: 936	152	: 18.2	: 2784
B128:	385	: 7.89	10	: 1.27	: 489	24	: 3.	: 1155	33	: 4.18	: 1,609
B129:	109	: 3.35	20	: 5.9	: 643	27	: 8.	: 872	20	: 5.9	: 643
B150:	251	: 8.	48	: 6.	: 1506	93	: 11.6	: 2911	21	: 2.6	: 652
B151:	385	: 3.9	30	: 7.7	: 2965	30	: 7.7	: 2965	10	: 2.6	: 1,001
Totls:	6372	: 272.39	1372	:	: 33580	1702	:	: 40981	3227	:	: 69,724

THE SISKIYOU BURN.

The Burn.

Location:

In the extreme southwestern end of the Rogue River Valley, Ore. near the Siskiyou Pass, in sections 16, 21 and 28, Twp 40 S, Range 2 E, Willamette Meridian.

Area:

Size of burned area 200 acres.

Topography:

Gentle and steep slopes of north and west exposures on the northern slopes of the Siskiyou Mountains.

Elevations:

Range from 3,200 to 4,000 feet.

Drainage:

The drainage is to the north thru Carter and Barron Creeks; both tributaries of Rogue River.

Soil:

Decomposed graite on the steep slopes; adobe on the bottoms.

Forest Cover:

Composed almost entirely of coniferous species; there is very little brush on the area.

Timber types:

A mixed stand of yellow pine, sugar pine, Douglas fir and white fir. Relative percentages of stand are approximately:

	<u>In No. Trees.</u>
Yellow pine	55.%
Sugar pine	3.%
Douglas fir	35.%
White fir	7.%
Total	100.%

Stand:

Pine timber on burned area:

	<u>In No. Trees.</u>	<u>In Volume.</u>
Yellow pine, green and fire injured ..	522	469,800
Yellow pine, infested 1918	43	44,390
	565	514,190
 Sugar pine, green and fire injured	26	41,340
Sugar pine, infested 1918	9	1,580
	35	42,920
 Total stand, both species	600	557,110

Infestation:

On burned area preceeding fire:

Yellow pine. <i>D. brevicornis</i> 1st 1918 genr.			
Diam.	Volume.	No. trees.	Volume.
12	120	1	120
14	140	1	140
		2	260

Fire:

Date of burn August 15, 1918.

Character of fire:

Ground fire of great intensity in the thickets of new growth and in the mature stands where there was an accumulation of debris. Light surface burning on the more open areas.

Resulting damage:

Many small and medium sized trees were scorched their entire lengths, a few were entirely killed.

TABLE I.

Table of comparative degree of fire injury.

: Yellow pine.				:
: Degree of fire injury	: Class	: No. trees.	: % of stand.	:
: Green, uninjured by fire	: I.	: 176	: 31.	:
: Killed by fire	: II.	: 18	: 3.	:
: Light burn, foliage scorched	: III.	: 205	: 37.	:
: Medium burn, trunk and foliage scorched:	: IV.	: 52	: 9.	:
: Heavy burn, trunk charred and foliage	:	:	:	:
: all burned off	: V.	: 114	: 20.	:
: Total	:	: 565	: 100.	:
: Sugar pine.				:
: Green, uninjured by fire	: I.	: 9	: 26.	:
: Killed by fire	: II.	: 1	: 3.	:
: Light burn, foliage scorched	: III.	: 18	: 51.	:
: Medium burn, trunk and foliage scorched:	: IV.	: 3	: 9.	:
: Heavy burn, trunk charred and foliage	:	:	:	:
: all burned off	: V.	: 4	: 11.	:
: Total	:	: 35	: 100.	:

Infestation developing after fire:

Summary 1918 infestation inside burned area.

				Total.	
		No.trees.	Volume.	No.trees.	Volume.
D.brevicomis 2nd genr in Y.P. ..		38	43,770		
D.monticolae 1918 genr in Y.P. .		3	360		
				41	44,130
D.monticolae 1918 genr in S.P. .		9	1,580		
				9	1,580
Total infestation developing after fire				50	45,710

TABLE II.

Volume table of the 1918 loss inside burn.

:Diam.:Unit		:D.b.2nd 18, Y.P.:		:D.m. 1918, Y.P.:		:D.m. 1918, S.P. :		:Total both:	
:Ins.	:Volume:	No.trees	Volume:	No.trees	Volume:	No.trees	Volume:	No.trs	Volm:
: 10 :	100 :	:	:	:	:	4	400 :	4	400 :
: 12 :	120 :	3	360 :	3	360 :	:	:	6	720 :
: 14 :	140 :	5	700 :	:	:	2	280 :	7	980 :
: 16 :	180 :	6	1,080 :	:	:	:	:	6	1,080 :
: 18 :	220 :	1	220 :	:	:	:	:	1	220 :
: 20 :	260 :	2	520 :	:	:	2	520 :	4	1,040 :
: 22 :	380 :	2	760 :	:	:	1	380 :	3	1,140 :
: 24 :	480 :	6	2,880 :	:	:	:	:	6	2,880 :
: 28 :	970 :	2	1,940 :	:	:	:	:	2	1,940 :
: 30 :	1170 :	1	1,170 :	:	:	:	:	1	1,170 :
: 32 :	1500 :	1	1,500 :	:	:	:	:	1	1,500 :
: 34 :	1860 :	2	3,720 :	:	:	:	:	2	3,720 :
: 40 :	2920 :	2	5,840 :	:	:	:	:	2	5,840 :
: 42 :	3260 :	2	6,520 :	:	:	:	:	2	6,520 :
: 48 :	4800 :	1	4,800 :	:	:	:	:	1	4,800 :
: 50 :	5880 :	2	11,760 :	:	:	:	:	2	11,760 :
:	:	38	43,770 :	3	360 :	9	1,580 :	50	45,710 :

TABLE III.

Class of trees attacked after fire.

Summary: Yellow pine.

				% of infestation.	
: Class.:	No.trees	Volume	No.trees	Volume	
: I. :	2	1,110	: 5.%	2.3%	
: II. :	6	18,290	: 15.%	41.4%	
: III. :	8	8,680	: 20.%	20.0%	
: IV. :	6	11,260	: 15.%	25.5%	
: V. :	19	4,790	: 45.%	10.8%	
: Totals	41	44,130	: 100.%	100.0%	

Summary: Sugar pine.

				% of infestation.	
Class	No. trees	Volume	No. trees	Volume	
I.					
II.					
III.	4	880	44.%	56.%	
IV.	3	340	33.%	22.%	
V.	2	360	23.%	22.%	
Totals	9	1,580	100.%	100.%	

TABLE IV.

Volume table of class of trees attacked after fire.

Yellow pine.

Diam.	Unit	Class L.	Class II.	Class III.	Class IV-V.
Ins.	Volume	No. trees	Volume	No. trees	Volume
12	120			1	120
14	140	1	140		4
16	180				6
18	220				1
20	260		1	260	1
22	380				2
24	480			4	1,920
28	970	1	970		1
30	1170		1	1,170	
32	1500				1
34	1860			2	3,720
40	2920		1	2,920	1
42	3260		1	3,260	1
48	4800		1	4,800	
50	5880		1	5,880	1
		2	1,110	6	18,290
				8	8,660
				25	16,050

Sugar pine.

10	100			1	100	3	300
14	140			1	140	1	140
20	260			1	260	1	260
22	380			1	380		
				4	880	5	700

AREA SURROUNDING THE BURN.

Topography:

Very similar to that within the burned area

Elevations:

North and east of the burned area the elevations are somewhat lower than on the burn. To the south and west they are higher, reaching the maximum on the crest of the Siskiyou Range at approximately 6,000 feet. The extreme range is from about 2,500 to 6,000 feet.

Forest Cover and Timber Types:

Heavy brush areas on the lower elevations: A mixed stand of yellow pine, Sugar pine, Douglas fir and white fir occurs on the intermediate elevations, white fir on the higher elevations. The mixed stand hold the approximate relative percentages of:

Yellow pine	45.%	of volume.
Sugar pine	5.%	" "
Douglas fir	40.%	" "
White fir	10.%	" "
Total	100.%	

Infestation Surrounding the Burned Area:

Unit.	Insect and host.	1917 - Year of loss.- 1918			
		No.trees	Volume	No.trees	Volume
Siskiyou Unit.	D.brevicomis 1st genr Y.P.	35	49,000	78	95,520
	D.brevicomis 2nd genr Y.P.	60	84,000	49	68,540
	Melanophila sp. in Y.P.			1	380
	D.monticolae all genrs in S.P.	2	4,810		
		97	137,810	128	164,450
MistletoeUnit.	D.brevicomis 1st genr in Y.P. .	40	28,410	58	52,000
	D.brevicomis 2nd genr in Y.P. .	85	58,850	34	29,150
	D.monticolae all genrsin Y.P. .	33	1,400	1	100
	D.monticolae all genrsin S.P. .	2	4,810		
		160	93,470	93	81,250
Lamb's Mine.	D.brevicomis 1st genr in Y.P. .	18	12,000	35	28,660
	D.brevicomis 2nd genr in Y.P. .	45	27,010	41	36,130
	D.monticolae genrs in Y.P.	5	780	3	360
	Melanophila sp. in Y.P.			1	480
	D.monticolae genrs in S.P.	8	16,410	2	2,520
		76	56,200	82	69,150
Ashland Unit.	D.brevicomis 1st genr in Y.P. ..				
	D.brevicomis 2nd genr in Y.P. ..				
	D.monticolea genrs in S.P.	116	116,190	205	201,280
		116	116,190	205	201,280

TABLE V.

Volume table of the 1918 insect loss in Hiskiyon Unit.

:Diam.:Unit :D.b.1st 16 Y.P.:D.b.2nd 18 Y.P.: Topkilled Y.P.:Flatd 18. Y.P.:									
:Ins.: Volume:No.trees Volume:No.trees Volume:No.trees Volume:No.trees Volume:									
: 12 :	120 :	1	120 :	3	360 :	:	:	:	:
: 14 :	140 :	3	420 :	1	140 :	:	:	:	:
: 16 :	180 :	4	720 :	2	360 :	:	:	:	:
: 18 :	220 :	2	440 :	:	:	1	220 :	:	:
: 20 :	260 :	5	1,300 :	4	1,040 :	:	:	:	:
: 22 :	380 :	5	1,900 :	5	1,900 :	:	1	380 :	:
: 24 :	480 :	16	7,680 :	4	1,920 :	3	1,440 :	:	:
: 26 :	700 :	9	6,300 :	3	2,100 :	:	:	:	:
: 28 :	970 :	:	:	7	6,790 :	2	1,940 :	:	:
: 30 :	1170 :	9	10,530 :	3	3,510 :	3	3,510 :	:	:
: 32 :	1500 :	2	3,000 :	2	3,000 :	1	1,500 :	:	:
: 34 :	1860 :	5	9,300 :	1	1,860 :	4	7,440 :	:	:
: 36 :	2110 :	3	6,330:	4	8,440 :	1	2,110 :	:	:
: 38 :	2610 :	5	13,050 :	2	5,220 :	2	5,220 :	:	:
: 40 :	2920 :	3	8,760 :	2	5,840 :	3	8,760 :	:	:
: 42 :	3260 :	2	6,520 :	2	6,520 :	1	3,260 :	:	:
: 44 :	3890 :	1	3,890 :	2	7,780 :	1	3,890 :	:	:
: 46 :	4590 :	1	4,590 :	:	:	1	4,590 :	:	:
: 48 :	4800 :	1	4,800 :	:	:	:	:	:	:
: 50 :	5880 :	1	5,880 :	2	11,760 :	1	5,880 :	:	:
:	:	78	95,530 :	49	68,540 :	24	49,760 :	1	380 :

MEMORANDUM TO SUPPLEMENT REPORT ON THE CHINQUAPIN BURN, DATED MAY, 1917.

The following memorandum is intended to supplement the original report on this burn submitted in May, 1917 and is based on data obtained in a recruise during the period November 4 to 7 Inc., 1918. Methods used in obtaining this data are outlined in the original report under paragraph headed, "How the Data was Obtained." In the recruise these methods were closely followed with only this deviation: Instead of making an intensive cruise of Sec. 6, a representative section of the area surrounding the burn, as was done in the first examination; an intensive cruise of the first zonal area, or that area within a one mile radius of the burn, was made in the last examination. The tree data resulting from the cruise of this area was used in erecting an average tree as the basis for tabulation of the trees spotted in the extensive reconnaissance of the other surrounding zonal areas. This is considered a fairer comparison as all factors bearing on this outlying infestation are more nearly correlated in this zone than those existing in section 6 only. As in the first examination the burned area was intensely cruised.

As the area was not examined in 1917 after that year's loss had occurred, it became necessary to pick up the 1917 loss in connection with that of 1918. This was easily done and very little difficulty was experienced in identifying the trees constituting these respective years losses.

The entire data is given in the accompanying tables:

Table Ia- is an extension of Table I and shows the accumulated loss within the burned area to the close of the 1918 loss.

Table Ib- shows the entire loss from all agencies in number of trees and board feet volume within the burned area to the close of the 1918 loss.

Table IIa- is an extension of Table II and shows the yearly insect loss per zonal area in and surrounding the burn and the percent of increase or decrease in yearly loss in these zones for succeeding years over preceding years.

Table IIIa-is an extension of Table III and gives a comparison of the unit yearly losses in the zonal areas to that of the unit area or the actual burned area.

The accompanying maps show the location of the trees representing the annual insect losses for the two years, 1917 and 1918.

Analysis of Yearly Loss in the Burn and in Surrounding Area.

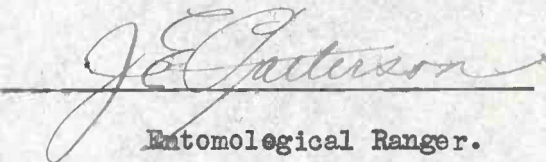
It will be seen that the first year's (1916) loss in B. F. volume subsequent to the fire amounted to an increase of 475% in the burn and a decrease of 70% in the immediate area surrounding the burn. The second year's (1917) loss in B. F. volume subsequent to the fire amounted to 293% increase in the burn and a decrease of 30% in the area surrounding the burn. The third year's (1918) loss in B. F. volume subsequent to the fire amounted to 583% increase in the burn and a decrease of 24% in the area surrounding the burn.

The above analysis would indicate that immediately after the fire infestation increased greatly in the burned area with a corresponding decrease in the area surrounding, but in subsequent seasons the infestation showed a tendency to regain its former status in the surrounding area , though showing no appreciable decrease in the burned area. It would

appear that in the next few years the infestation within and out of the burn will approximate that which existed previous to the fire with this result; that the loss to the stand in this locality had increased considerably owing to the apparent stimulus given the beetles through conditions resultant upon the fire.

Absolute deductions are impossible at this time owing to a number of factors which must be considered. These will require further study in connection with other burns before definite conclusions can be formed.

Respect fully submitted,


Entomological Ranger.

Ashland, Oregon.
February 18, 1919.

TABLE Ia.

IN THE BURN.LOSS DUE TO FIRE AND INSECTS.

Year of Loss.	---Yellow Pine---					
	Trees killed by fire alone.		Trees killed by insects alone.		Trees weakened by fire, killed by in-	
	No.trees-	Volume	No.trees-	Volume	No.trees-	Volume.
Extension of totals from Table I.	12	5,835	33	27,120	71	25,220
1917			6	11,090	16	8,320
1918			12	7,740	24	26,380
Totals	12	5,835	51	45,950	111	59,920

Note: This table is an extension of Table I and should be used in connection thereto.

TABLE Ib.

IN THE BURN.ENTIRE LOSS FROM ALL AGENCIES.

- Yellow Pine -					
Agent responsible for loss	Loss per year.			Total loss	
	Year:	No. trees	Volume	No. trees	Volume
Trees killed by fire alone	'1915	12	5,835	12	5,835
Trees weakened by fire, killed by insects.	'1916	71	25,220		
	'1917	16	8,320		
	'1918	24	26,380		
				111	59,920
Trees killed by insects alone	'1914	10	18,970		
	'1915	14	4,940		
	'1916	9	3,210		
	'1917	6	11,090		
	'1918	12	7,740		
				51	45,950
Grand total-----				174	111,705

TABLE IIa.

INSECT LOSS PER UNIT AREA.IN AND SURROUNDING BURN.

--Yellow pine--			Yearly loss									
	Area acres	Unit area	-After burn-						Infestation per cent (%) succeed- year over preceding year.			
			1916		1917		1918		1917 over 1916		1918 over 1917	
			No. trees	Vol.	No. trees	Vol.	No. trees	Vol.	Increase	Decrease	Increase	Decrease
In the burn	220	1	80	28,430	22	19,410	36	34,120		31.7	75.9	
Out of burn												
in 1 mile	1791	8	35	17,325	15	13,350	34	30,140		23.	125.8	
radius (zonal												
area 1)												
Out of burn in												
2 mile radius												
(zonal area 2)	6031	27	20	9,900	54	48,060	61	54,290	385.4		13.	
Out of burn in												
2½ mile radius	4525	21	16	7,920	22	19,588	6	5,340	147.3			73.
(zonal area 3)												

TABLE IIIa.

COMPARISON OF INSECT LOSSES PER UNIT AREA.AREA OF BURN 220 ACRES: THE UNIT AREA.

Yellow Pine		Total yearly losses per unit area.					
	Area acres	Unit areas	Previous to 1917.	1917		1918	
			Datum for this column in Table III.	No.trees:	Volume	No.trees:	Volume
In the burn	220	1		22	19,410	36	34,120
Out of the burn in 1 mile radius (zonal area 1)	1791	8		2	1,669	4	3,767
Out of burn in 2 mile radius (zonal area 2)	6031	27		2	1,800	2	2,011
Out of burn in 2½ mile radius (zonal area 3)	4525	21		1	933	25	255
	12560	57					



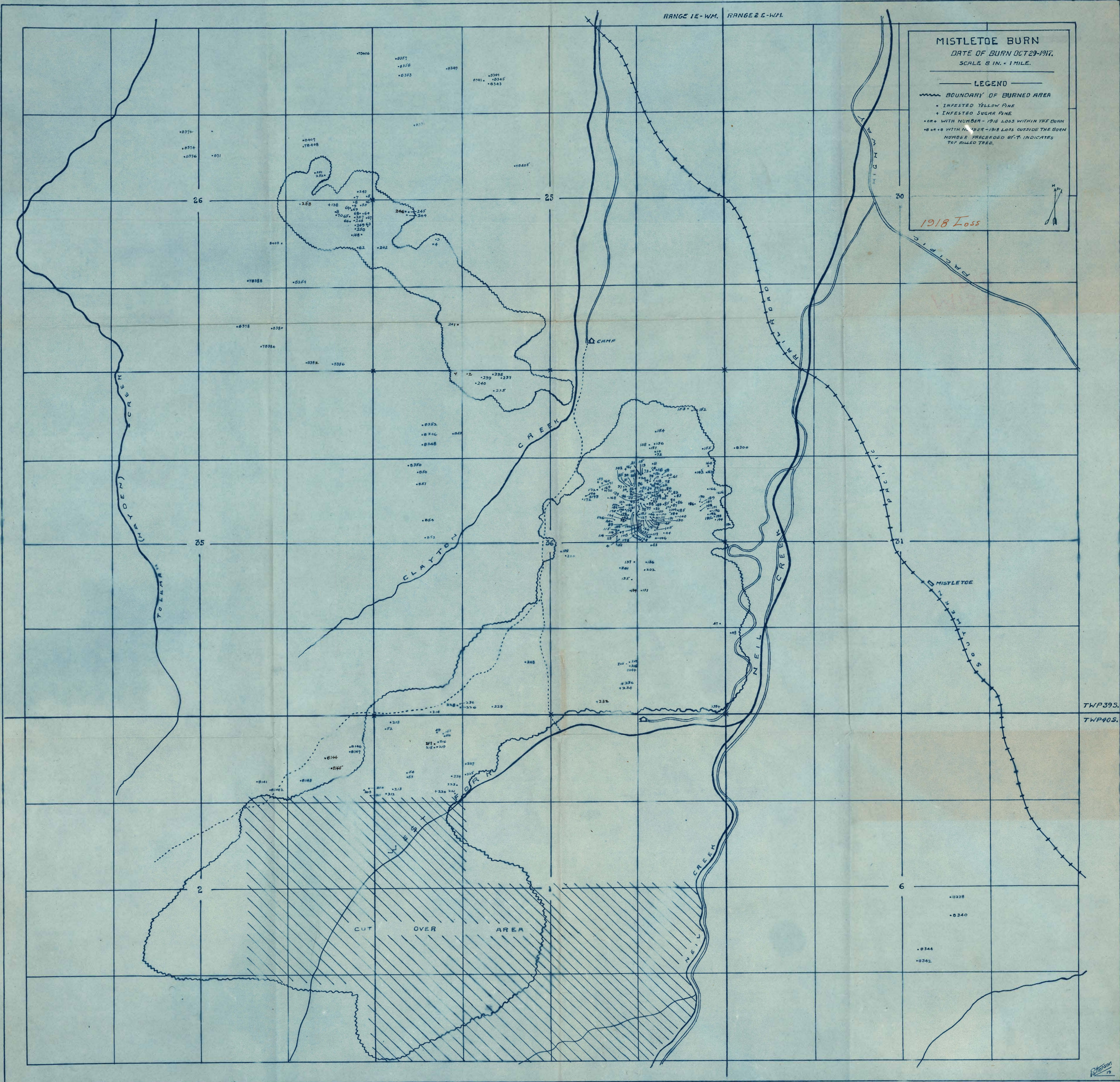
No. 1. Mistletoe Burn: Showing heavy fire damage on the lower elevations of the area where the forest cover is principally brush and new growth. The fire was very intense in these areas resulting in the killing of both brush and new growth. Photo by J.M. Miller.



No. 2. Mistletoe Burn: A thicket of new growth where the heat was intense. All the saplings shown are dead; killed outright by the fire. Many such thickets occur on the area. Photo by J.M. Miller.



No. 3. Siskiyou Burn: Showing "pitch tubes" of *Dendroctonus brevicomis* on the fire scorched, and blackened, basal trunk of a yellow pine tree. The charred bark apparently had no repellent action to attack by the barkbeetles. Photo by J.E.Patterson.



SISKIYOU BURN, ORE.

TWP 40 S RANGE 2 E-MW

SCALE 8 IN = 1 MILE

DATE OF BURN AUGUST 29-1918

LEGEND

~~~~~ BOUNDARY OF BURNED AREA

### 1918 INFESTATION.

Inside Burned Area:

• and Number - Infested yellow pine trees.

+ and Number - Infested sugar pine trees.

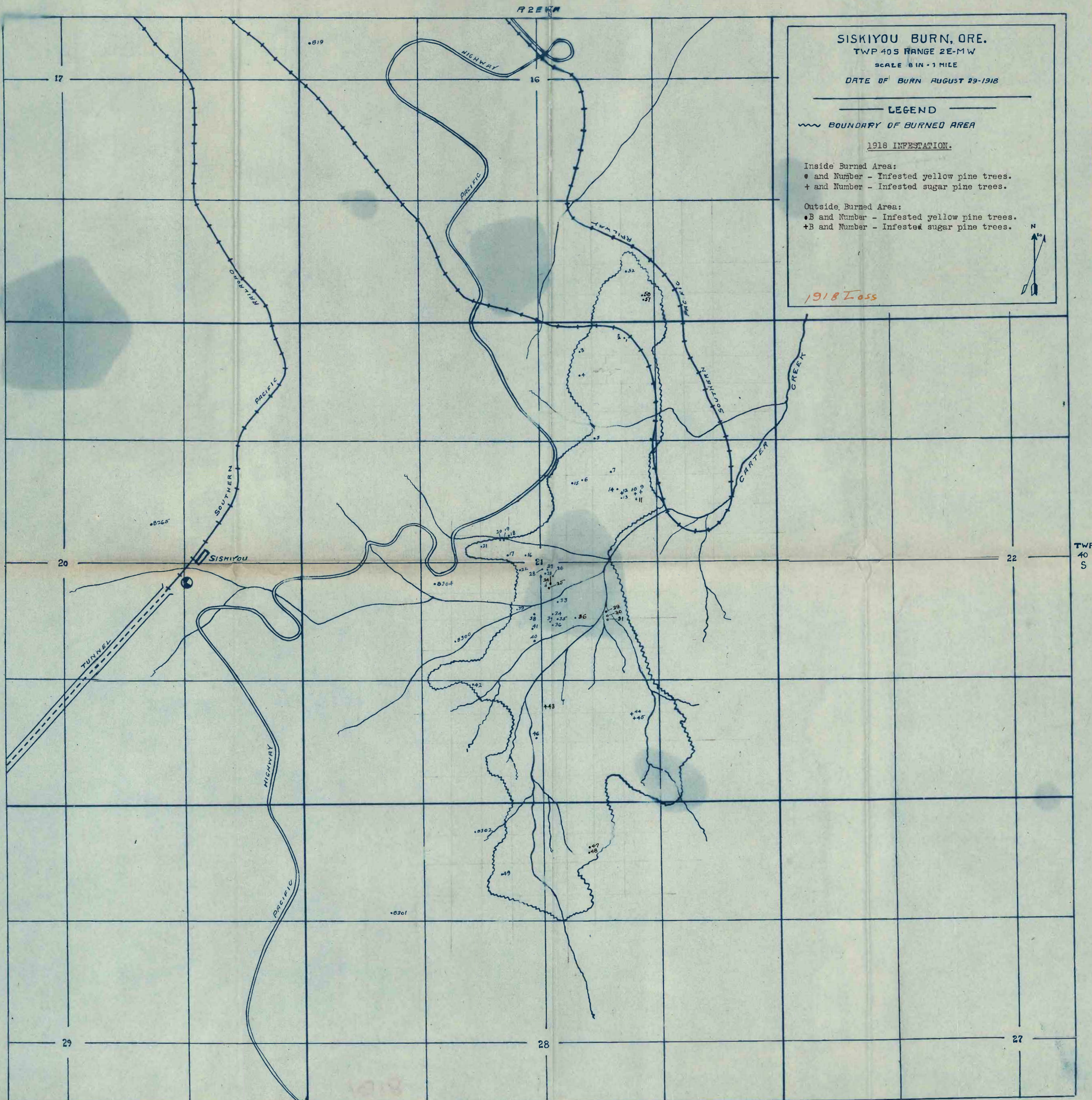
Outside Burned Area:

•B and Number - Infested yellow pine trees.

+B and Number - Infested sugar pine trees.



1918 Loss



TWP  
40 S

R. L. Brown

